

REMARKS

Claims 1, 20, and 23 have been amended. Support for the amendments to claims 1, 20, and 23 may be found – at least – at paragraph [0044] and FIG. 1. No new matter has been added.

In the Office Action dated July 14, 2005, claims 20-22 were rejected under 35 U.S.C. 102(e) as being anticipated by Harpaz (U.S. Patent Application No. 2004/0204777). Applicants respectfully traverse this rejection.

Independent claim 20 recites a reference frame for use in a lithographic apparatus. The lithographic apparatus includes a base frame for supporting at least one of a substrate and a patterning structure. The reference frame comprises a material having a coefficient of thermal expansion of greater than about $2.9 \times 10^{-6}/K$. In use, the reference frame is dynamically isolated from the base frame. Harpaz does not disclose or suggest all of the features of claim 20.

Harpaz discloses the use of a base (10) that supports a moving element (12), such as a substrate, workpiece, mask, or any process equipment supported for motion with respect to the base (10). (Harpaz at [0009].) Hence, the “frame of reference” that Harpaz discloses is a base and not a reference (or metrology) frame as it is defined by Applicants in Applicants’ specification and as it is claimed in claim 20. As discussed in Applicants’ specification, reference frames are conventionally made from materials having a low coefficient of thermal expansion, such as alloys including INVAR™. (Applicants’ specification at [0004].) As disclosed by Harpaz, granite machine bases are well known in the art. Applicants are not claiming a base frame that comprises a material having a coefficient of thermal expansion of greater than about $2.9 \times 10^{-6}/K$. Applicants are claiming a reference frame (which is also defined as a metrology frame in the specification at [0044]) comprising a material having a coefficient of thermal expansion of greater than about $2.9 \times 10^{-6}/K$.

Because Harpaz does not disclose or suggest all of the features of claim 20, Applicants respectfully submit that claim 20 and claims 21 and 22 that depend therefrom are patentable over Harpaz, and respectfully request that the rejection to claims 20-22 be withdrawn.

In the Office Action, claims 1-10, and 12-23 were rejected under 35 U.S.C. 103(a) as being unpatentable over Shima (U.S. Patent No. 6,822,727) in view of Harpaz. Applicants respectfully traverse this rejection.

Independent claim 1 recites a lithographic apparatus that includes, *inter alia*, “a base frame that supports at least one of the support structure and the substrate support; and a reference frame that provides a reference surface with respect to which a position of at least one of said substrate and said patterning structure is measured, the reference frame being dynamically isolated from the base frame, wherein said reference frame comprises a material having a coefficient of thermal expansion of greater than about $2.9 \times 10^{-6}/K$.” The combination of Shima and Harpaz does not disclose or suggest all of the features of claim 1.

Shima discloses an exposure apparatus that includes a projection optical system, a substrate stage, a substrate transport system, and a position detection system for detecting an alignment mark on the substrate. (Shima at Abstract.) Aside from FIG. 3, Shima does not disclose any details about a base or a metrology frame. The Examiner has asserted that Shima discloses a reference frame (FR), but Shima uses FR to designate “a usable region FR in FIG. 3, which is a region of the wafer W in which the pattern image of the mask R can be projected.” (Shima at col. 10, lns. 19-21.)

Harpaz is discussed above. Even if Harpaz was combined with Shima, all of the features of claim 1 are not disclosed because the combination of Shima in view of Harpaz does not disclose or suggest a lithographic apparatus that includes, *inter alia*, the claimed reference frame that comprises a material having a coefficient of thermal expansion of greater than about $2.9 \times 10^{-6}/K$.

Accordingly, Applicants respectfully submit that claim 1 and claims 2-19 are patentable over Shima in view of Harpaz, and respectfully request that the rejection to claims 1-10 and 12-19 be withdrawn.

Independent claim 20, Shima, and Harpaz are discussed above. Because the combination of Shima and Harpaz does not disclose or suggest a reference frame for use in a lithographic apparatus that comprises a material having a coefficient of thermal expansion of greater than about $2.9 \times 10^{-6}/K$, as claimed by claim 20, claim 20 and claims 21 and 22 that depend therefrom are patentable over Shima in view of Harpaz. Accordingly, Applicants respectfully request that the rejection to claims 20-22 be withdrawn.

Independent claim 23 recites a device manufacturing method that includes, *inter alia*, “projecting the patterned beam of radiation onto a target portion of a substrate, the substrate being supported by a base frame; providing a reference frame comprising a reference surface, the reference frame comprising a material having a coefficient of thermal expansion of

greater than about $2.9 \times 10^{-6}/K$, the reference frame being dynamically isolated from the base frame.”

Shima and Harpaz are discussed above. The combination of Shima and Harpaz does not disclose or suggest a device manufacturing method that includes all of the features of claim 23. For example, neither Shima nor Harpaz discloses or suggests a device manufacturing method that includes, *inter alia*, “providing a reference frame comprising a reference surface, the reference frame comprising a material having a coefficient of thermal expansion of greater than about $2.9 \times 10^{-6}/K$, the reference frame being dynamically isolated from the base frame,” as it is claimed by claim 23. Accordingly, Applicants respectfully submit that claim 23 is patentable over Shima in view of Harpaz, and respectfully request that the rejection to claim 23 be withdrawn.

In the Office Action, claim 11 was rejected under 35 U.S.C. 103(a) as being unpatentable over Shima in view of Harpaz and further in view of Shirashi (U.S. Patent No. 6,020,950). Applicants respectfully traverse this rejection.

Claim 11 depends from claim 1. As discussed above, claim 1 is patentable over Shima in view of Harpaz. Shirashi does not make up for the deficiencies of Shima and Harpaz. Shirashi discloses a projection exposure apparatus, but does not even disclose a base frame, or a metrology frame, or reference frame. Because the combination of Shima, Harpaz, and Shirashi does not disclose or suggest all of the features of claim 1 or claim 11, Applicants respectfully submit that claim 11 is patentable over Shima in view of Harpaz and further in view of Shirashi. Accordingly, Applicants respectfully request that the rejection to claim 11 be withdrawn.

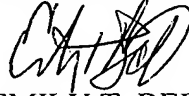
All rejections and objections having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited. If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

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Respectfully submitted,

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